

New class of biological radioprotectors, Phase I

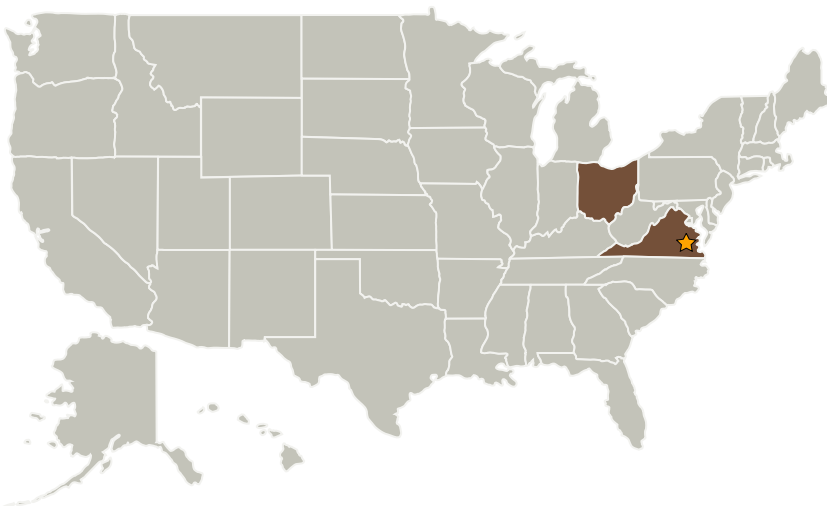
Completed Technology Project (2004 - 2004)



Project Introduction

Space radiation is the major risk to the astronauts outside the Earth magnetosphere that cannot be eliminated by the existing radioprotectors. The ultimate goal of this proposal is to develop a new class of pharmacological agents for protection against space radiation using a new source of natural products ?potent cell survival factors produced by endosymbiotic and parasitic microorganisms. Induction of programmed cell death (apoptosis) occurring in radiosensitive tissues is one of the major determinants of radiation-induced failure of hematopoietic and digestive systems and other pathologies, including pathological changes in the nervous system. As a part of their survival strategy, endosymbiotic and parasitic microorganisms evolved to produce powerful anti-apoptotic factors suppressing cell death in infected tissues; such factors were found to be effective radioprotectors. CBLB-501 protein isolated from Salmonella belongs to this category; it provides complete rescue of mice from lethal doses of gamma radiation causing hematopoietic and gastrointestinal syndromes. The proposed program is aimed at developing CBLB-501 into a useful radioprotective agent. It includes: a) evaluation of the radioprotective properties of CBLB501 in the animal model system; and optimization of treatment regimens, (b) development of optimized structural derivatives of CBLB-501, and (c) design and evaluation of combinatorial therapies employing CBLB501 together with most efficient conventional radioprotectors.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Cleveland BioLabs, Inc.	Supporting Organization	Industry	Cleveland, Ohio

Primary U.S. Work Locations	
Ohio	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Pavel G Komarov

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.5 Radiation
 - └ TX06.5.1 Radiation Transport and Risk Modeling